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groups, which is rather significant. If the evidence represented by these two small series is borne out by further investigation, the high mortality of streptococcus infections may be explained, since group 1 is much the largest group and consequently is the commonest infecting organism.

The experiments dealing with the protective properties of the serum of each group indicate a further practical reason for the classification of these groups. Each group serum, as was seen in the protocols, protected against infection with its own strains, but afforded no protection whatever against strains of other groups. If specific therapy of hemolytic streptococcus infections is possible, it would seem that it can be successful only on the basis of the consideration of the group to which the infecting organism belongs.

In spite of these considerations, the practical importance of the classification of the hemolytic streptococci must at this time be regarded as problematical. No surmise as to whether these groups will furnish epidemiologic data which will aid in the prevention of infections with this organism or whether therapeutic serums can be produced which will be of value in combating such infections can of course be made at this time. However, a glance at the previous chaotic condition of our knowledge of these comparatively common infections shows how insecure was the basis of any attempt at serum or vaccine therapy in the past. With the foundation which a knowledge of a possible classification of hemolytic streptococci furnishes, future attempts toward the prevention and treatment of these infections can be more intelligent and, in consequence, progress should be more rapid.

SUMMARY

Hemolytic streptococci can be classified by means of practical serologic tests.

From a study of 292 strains from widely varied sources, 3 distinct groups, constituting 93% of the series, have been determined by means of such tests.

Diagnostic serums can be produced for each group, and all infections due to hemolytic streptococci should be classified.

A protective serum for mice against each of these 3 groups has been demonstrated. Each serum is specific for its own group, furnishing no protection against other groups.

AN EPIDEMIC OF WATER-BORNE DYSENTERY

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On Aug. 28, 1918, it was brought to the writer's attention that diarrhea of a very violent type was attacking the inhabitants of Bertrichamp, a town of about 2,000 population, in the department of Meurthe-Moselle, France.

Investigation brought out the following facts: 1. The symptoms of the disease were practically identical in all cases where it was possible to obtain information. Enteric pains were soon followed by diarrhea. Stools were frequent and contained large quantities of blood and mucus which persisted in the feces from two to eight days in the various cases. Passages were accompanied by considerable tenesmus. No vomiting was reported. A rise in temperature to from 99.5 to 100.5 F. was noted in all cases, as well as marked increase in the pulse rates. Several patients seemed apparently on the way to recovery when a sudden collapse, followed by fatal termination of the disease, occurred. 2. Lack of ventilation, and large numbers of flies were noted in all rooms where patients were found. 3. Persons attacked varied in age between 5 and 69 years. 4. No patient had drunk milk or eaten uncooked vegetables for some time prior to the onset of the disease. 5. All patients but two admitted having drunk water from the public supply a short time, usually two or three days, before the first attack. The two who did not admit having drunk water were young children whose evidence was not entirely trustworthy.

The usual precautions were immediately taken to prevent further spread of the disease. Feces were sterilized and buried, flies were driven out, ventilation and cleanliness insisted on. On August 29 the order was given to boil all water used.

Possibly it may not here be out of place to note that a Frenchman will admit drinking water only very reluctantly. For epidemiologic purposes this has a double meaning: Any water history, although more difficult to obtain, will be very accurate; more important, perhaps, any water-borne epidemic will be less widespread in a French town of given population than in an American town having an equal number of inhabitants.

Received for publication June 10, 1919.

Cases appeared on the following days:

August 18	5	
August 19	1	
August 20	1	
August 21	4	
August 24	4	
August 25	1	
August 27	2	
August 28	1	
August 29	2	
Date undetermined	1	
September 4	1	
September 8	2	
September 9	2	Last cases to appear.
Total	27	

Among the cases, 7 appeared in families which had a previous case of the disease. Of the 7, five appeared after August 24, so may be regarded as possible contact developments.

Of the cases which developed during September, two had visited friends sick of the disease, and two had ignored the order to boil water before using. The patient who developed diarrhea September 4 had used only boiled water since August 29 and had visited no one.

Cultures from feces of patients showed a nonmotile, gram-negative bacterium having the morphology of B. dysenteriae, which gave the growth and reddening characteristic of B. dysenteriae and B. typhosus on Russell's double sugar medium, and which failed to agglutinate with an antityphoid serum of known potency; because of complicating factors, it was not possible to make direct agglutination tests for B. dysenteriae.

Treatment given patients by the civilian doctor in attendance consisted in an almost total restriction of diet, three or four tablespoonfuls of sugar-water being given during the day. In only two cases was antidysentery serum given — both times after the disease had been running several days — and then only in very limited amounts.

Deaths among civilian patients occurred on the following days:

August 25	4	
August 26	2	
August 27	1	
August 29	1	
August 30	1	Last death.
Total	9	

The death rate, as will be noted, was 33 per cent. The probable reasons for this high mortality lie in the poor physical conditions of the patients, consequent on four years of poor nutrition and bad living conditions; and in the insufficient treatment given those sick of the disease.

During the period from August 20 to August 30 one French and six American soldiers suffering from diarrhea of the same type were admitted to the military hospitals of this area. Investigation showed that these men had all been quartered in Bertrichamp. Each gave a history of having drunk untreated water from fountains on the main source of supply for the town from two to four days before coming to the hospitals. Cultures from feces were made and B. dysenteriae Flexner found in five of the cases.

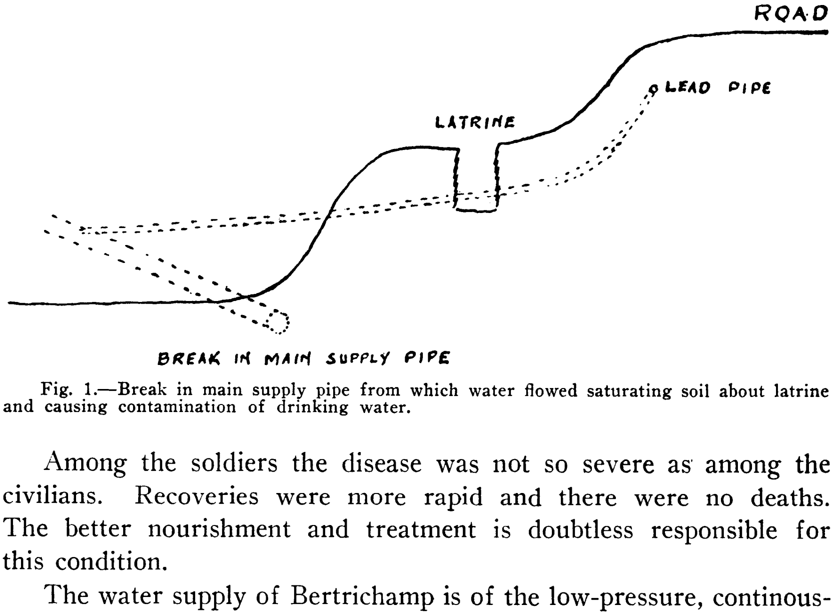

Fig. 1.—Break in main supply pipe from which water flowed saturating soil about latrine and causing contamination of drinking water.

Among the soldiers the disease was not so severe as among the civilians. Recoveries were more rapid and there were no deaths. The better nourishment and treatment is doubtless responsible for this condition.

The water supply of Bertrichamp is of the low-pressure, continous-flowing-fountain type frequently found in the villages of the Vosges mountains. There are four separate sources from which water is brought into the town by terra-cotta mains. Each of these distribution systems supplies fountains in a different section of the town and is in no way connected with the other sources. The main supply (on which are 10 of the 16 fountains of the town) comes from springs in the forest about two miles back of the town.

A bacteriologic examination of water from each of the fountains of the town was made on August 28. These examinations showed that three of the sources of supply were excellent, but that on the main